10th Class 2017

Biology	Group-I	Paper-II
Time: 1.45 Hours	(Subjective Type)	Max. Marks: 48

(Part-I)

2. Write short answers to any FIVE (5) questions: 10

(i) Differentiate between acute and chronic bronchitis.

Ans Acute and chronic bronchitis are two major types of bronchitis.

The acute bronchitis usually lasts about two weeks and patients recover with no permanent damage to the bronchi or bronchioles.

In chronic bronchitis, the bronchi develop chronic inflammation. It usually lasts for three months to two years.

(ii) What is nicotine?

Ans Nicotine is a powerful poison and was widely used as an insecticide in the past. When inhaled through tobacco smoking, it reaches our circulatory system and not only hardens the walls of the arteries but also damages the brain tissues.

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(iii) Define hydrophytes with an example.

Ans Hydrophytes are the plants which live completely or partially submerged in freshwater. Such plants do not face the problem of water shortage. The most common example of such plants is water lily.

(iv) Name two major parts of a nephron.

Ans Two major parts of a nephron are:

1. Renal Corpuscle
2. Renal Tubule

(v) What is lithotripsy?

Ans **Lithotripsy** is another method for the removal of kidney stones. In this method, non-electrical shock waves from outside are bombarded on the stones in the urinary system. Waves hit the dense stones and break them. Stones become sand-like and are passed through urine.

(vi) Define co-ordinators with examples.

Ans These are the organs that receive information from receptors and send messages to particular organs for proper action.

In nervous coordination, brain and spinal cord are coordinators.

(vii) Differentiate between sensory and motor neurons.

Ans Sensory nerves contain the axons of sensory neurons only. Motor nerves contain the axons of motor neurons only.

(viii) What is nerve impulse?

Ans A nerve impulse is a wave of electrochemical changes that travels along the length of neurons.

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3. Write short answers to any FIVE (5) questions: 10

(i) Differentiate between hyaline and fibrous cartilage.

Ans Hyaline cartilage is strong yet flexible. It is found covering the ends of the long bones, in the nose, larynx, trachea and bronchial tubes. While fibrous cartilage is very tough and less flexible due to large number of thick collagen fibres present in knitted form. It is found in intervertebral discs.

(ii) How lower jaw is different in mammals from other lower vertebrates? Also give its advantage.

Ans In lower vertebrates, the lower jaw is made up of more than one bone, while in mammals, it is made of single bone. During evolution, mammals modified the lower jaw bones and incorporated four of them into the middle year. This adaptation proved beneficial for mammals

(iii) How budding occurs in corals?

Ans In corals, the buds do not detach from the parent body. The corals form big colonies because the buds grow into new organisms by remaining attached to the parent body.

(iv) How plants reproduce by suckers? Give example.

Ans A sucker grows underground from some distance and then turns up, producing the new plant. Mint and chrysanthemum reproduce in this way.

(v) What is cloning?

Ans Cloning is the latest method of vegetative propagation. In this method, identical offsprings are produced from a single parent using its vegetative tissue or cell.

(vi) Describe two major processes of organic evolution.

Ans Organic evolution includes two major processes:

1. Alteration in genetic characteristics (traits) of a type of organism overtime.
2. Creation of new types of organisms from a single type.

(vii) What is "theory of special creation"?

Ans The anti-evolution ideas support that all living things had been created in their current form only a few thousand years ago. It is known as the "Theory of special creation."

(viii) Name nitrogenous bases found in DNA molecule.

Ans Adenine, guanine, cytosine and thymine are the nitrogenous bases of DNA.

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4. Write short answers to any FIVE (5) questions: 10

(i) Differentiate between intra-specific interaction and inter-specific interaction.

Ans The interaction among the members of different species is called as inter-specific interaction. While the interaction among the members of the same species is called as intra-specific interaction.

(ii) What is meant by predation? Give an example.

Ans It is an interaction between two animals of different species or between a plant and an animal. In predation, one organism (the predator) attacks, kills and feeds on other organism (the prey) *e.g.*, frog preys upon mosquitoes and fox preys upon rabbit.

(iii) What is recombinant DNA?

Ans Genetic engineering or recombinant DNA technology involves the artificial synthesis, modification, removal, addition and repair of the genetic material (DNA). If host organism is a microorganism, such as a bacterium, the transferred DNA is multiplied many times as the microorganism multiplies. Consequently, it is possible to obtain millions of copies of a specific DNA inside a bacterial cell.

(iv) Define pharmachology.

Ans The study of drug composition and properties and medical application, is called pharmacology.

(v) How bio-technology has helped us in improving the environment?

Ans Bio-technology is helping for better environment *e.g.*, bacterial enzymes are used to treat sewage water to purify it.

(vi) What are tetracyclines? Give an example.

Ans Tetracyclines are broad-spectrum bacteriostatic antibiotics and inhibit bacterial protein synthesis. For example, these are used in the treatment of infections of respiratory tract, urinary tract, intestine, etc.

(vii) What are sedatives? Give an example.

Ans These drugs react with central nervous system (CNS) and suppress its activities. An individual feels drowsiness by the use of these drugs. Long-term use of these drugs is dangerous. Sedatives induce sedation by reducing irritability or excitement *e.g.*, diazepam.

(viii) What are synthetic drugs?

Ans Such drugs do not occur naturally but are synthesized in laboratory. Pharmaceutical companies produce these drugs *e.g.*, aspirin.

(Part-II)

NOTE: Attempt any TWO (2) questions.

Q.5.(a) What is nephron? Describe its structure and also draw labeled diagram. (4)

Ans **NEPHRON:**

The functional unit of the kidneys is called nephron. There are over one million nehprons in each kidney. There are two parts of a nephron *i.e.*, renal corpuscle and renal tubule.

Renal Corpuscle:

The renal corpuscle is not tubular and has two parts *i.e.*, glomerulus and Bowman's capsule. Glomerulus is a network of capillaries while Bowman's capsule is a cup-shaped structure that encloses glomerulus.

Renal tubule:

The renal tubule is the part of nephron which starts after the Bowman's capsule. Its first portion is called the proximal convoluted tubule. Next portion is U-shaped and is called the Loop of Henle. The last portion of renal tubule is the distal convoluted tubule.

Collecting Duct:

The distal convoluted tubules of many nephrons open in a single collecting duct. Many collecting ducts join together to form several hundred papillary ducts which drain into renal pelvis.

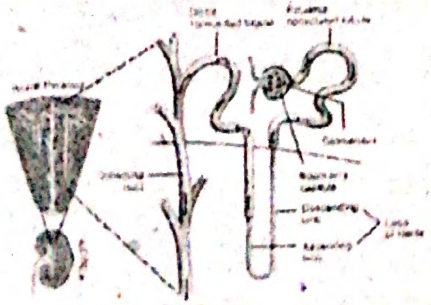
Distal convoluted tubule
Proximal convoluted tubule
Collecting duct
Bowman's capsule
Descending limb
Loop of Henle
Ascending limb

Fig. The structure of a nephron.

(b) Write the name and functions of lobes of cerebrum. (4)

Ans

Lobe	Function
Frontal	Controls motor functions, permits conscious control of skeletal muscles, and Coordinates movements involved in speech.
Parietal	Contains sensory areas that receive impulses from skin.
Occipital	Receives and analyzes visual information.
Temporal	Concerned with hearing and smell.

Q.6.(a) Define joint. Describe its different types. (4)

Ans **Joints:**

"A joint is the location at which two or more bones make contact. They allow movement and provide mechanical support."

Joints can be classified on the basis of the degree of movement they allow:

Immoveable (Fixed) joints:

Such joints allow no movement *e.g.,* the joints between the skull bones.

Slightly moveable joints:

Such joints allow slight movements *e.g.,* joints between the vertebrae.

Moveable joints:

They allow a variety of movements *e.g.,* shoulder joint, hip joint, elbow joint, knee joint, etc. There are many types of moveable joints in body. The main types are hinge joints and ball-and-socket joints. Hinge joints move back and forth like the hinge on a door and allow movements in one plane only. The knee and elbow are hinge joints. Ball-and-socket joints allow movement in all directions. The hip and shoulder joints are ball-and-socket joints.

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(b) Describe four different ways of natural vegetative propagation. **(4)**

Ans **Natural Vegetative Propagation:**

Vegetative propagation occurs naturally in several ways:

1. Bulbs are short underground stems surrounded by thick, fleshy leaves that contain stored food. Adventitious roots emerge under the base of bulb while shoots emerge from the top of the base. Tulips, onions and lilies reproduce by bulbs.
2. Corms are short and swollen underground stems containing stored food. Buds are present at the top of corm. From a bud, shoot grows and forms a new plant. Dasheen and garlic reproduce by corms.
3. Rhizomes are horizontal underground stems with scale leaves. There are enlarged portions called nodes on rhizome. Buds are produced at nodes. The buds present on the upper surface of rhizome give rise to shoot. The lower surface of rhizome produces adventitious roots. Ginger, ferns and water lilies reproduce by rhizomes.
4. Stem tubers are the enlarged portions of an underground stem (rhizome). There are aggregations of tiny buds in the form of “eyes” along the surface of tuber. Each bud develops into shoot that grows upward and also produces roots. Potatoes and yams reproduce by tubers.

Q.7.(a) What is global warming? Describe its causes. **(4)**

Ans **Global Warming and its Causes:**

The addition of greenhouse gases (*e.g.*, carbon dioxide, methane, ozone) in atmosphere increases the temperature of the Earth. These gases remain in the lowest part of Earth’s atmosphere and do not allow solar radiations to reflect back into space. As a result, heat remains within the Earth's atmosphere and increases its temperature. This is called global warming.

Due to global warming, polar ice-caps and glaciers are melting faster than the time taken for new ice layers to form. Sea water is also expanding causing sea levels to rise. Due to melting glaciers, rivers overflow and cause floods.

(b) Describe basic steps in genetic engineering. (4)

Ans The important steps of genetic engineering are as follows:

(i) Isolation of the gene of interest:

Firstly, the genetic engineer identifies the gene of interest in the donor organism. Special enzymes like restriction endonucleases are used to cut the identified gene from the DNA of donor organism.

(ii) Insertion of gene into vector:

A vector is selected for the transfer of isolated gene of interest to the host cell. The vector may be plasmid (extrachromosomal DNA present in many bacteria) or a bacteriophage. The gene of interest is attached with the vector DNA by using endonuclease (breaking enzyme) and ligase (joining enzyme). The vector DNA and the attached gene of interest are collectively called as recombinant DNA.

(iii) Then the recombinant DNA is transferred to a target host cell. In this way, the host organism is changed into genetically modified organism (GMO).

(iv) Then a suitable culture medium is provided to GMO for growth to give as much copies of the gene of interest as needed.

(v) The GMO contains the gene of interest and manufactures the desired product. Then this product is isolated from culture medium.